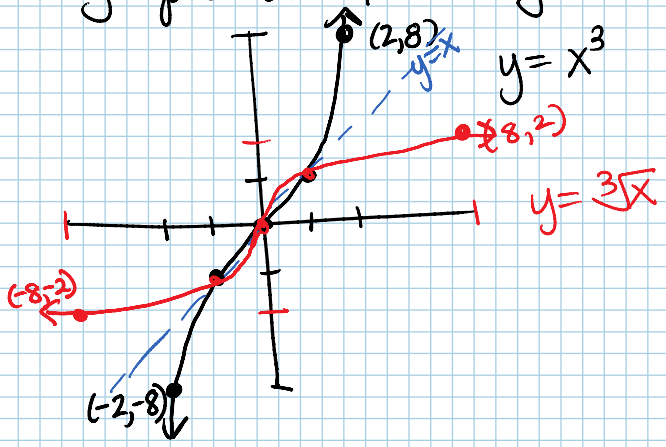
Tuesday, September 8, 2015

1. **Composition Opener**
2. **Homework Check**
3. **1.5 Notes - Inverses**
4. **Review 1.1 - 1.3 Quizzes (time permitting)**

1.5 Inverses

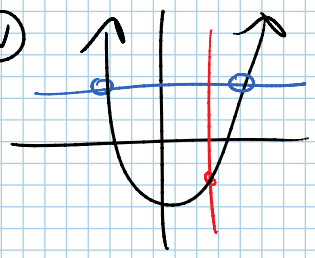
- switch x and y to create a new function
- inverses undo each other
- graphs reflect over $y = x$



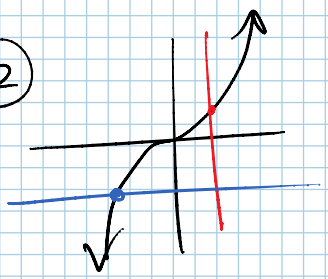
If both function and inverse are functions, called one-to-one.

Function: vertical line test

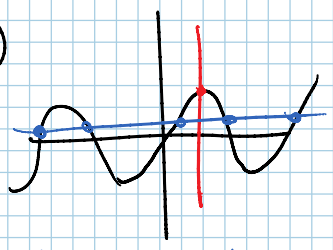
Inverse: horizontal line test

① 

Inverse not a function — Not one-to-one

② 

One-to-one

③ 

Inverse not a function — Not one-to-one

④ Find the inverse & domain.

$f(x) = 2x - 3$

Dom: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

$y = 2x - 3$

① Switch x and y $x = 2y - 3$

② Solve for new y $\frac{x+3}{2} = \frac{2y}{2}$

$y = \frac{x+3}{2}$ OR $y = \frac{1}{2}x + \frac{3}{2}$

③ Notation $f^{-1}(x) = \frac{x+3}{2}$

Dom: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

⑤ $f(x) = \sqrt{x+2}$

$y = \sqrt{x+2}$

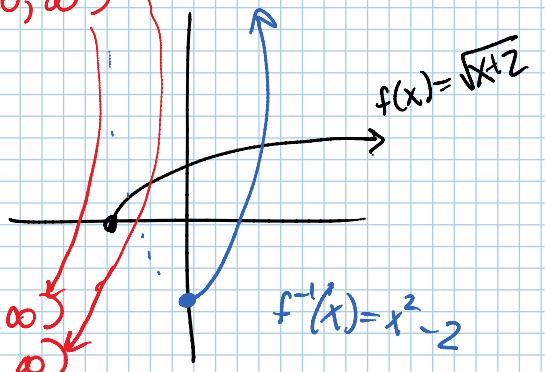
$x^2 = \left(\sqrt{y+2}\right)^2$

$x^2 = y + 2$

$y = x^2 - 2$

$\boxed{f^{-1}(x) = x^2 - 2}$

Dom: $[-2, \infty)$
Range: $[0, \infty)$



Dom: $[0, \infty)$
Range: $[-2, \infty)$

Dom & Range switched